Characterization of Wetting Behavior for Type III and IV Systems: A Topologic Approach

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This work is devoted to describing the wettability of the binary heteroazeotrope that characterizes mixtures of Types III and IV. We adopted the gradient theory, applied to the van der Waals equation of state (EOS), to predict the phase equilibrium conditions and the interfacial tension. Such an approach provides the basic information required to infer the wetting behavior. In addition, the approach in question allows us to relate specific details with the phase equilibrium topology that, in turn, is completely characterized by the global phase diagram of the EOS. A continuous evolution of behavior from Type III to IV has been calculated by modifying the mixing rule parameters. Then, wetting regimes have been characterized as a function of the evolution between Types. Results reveal that wetting regimes are sensitive to the Type, as follows from the fact that wetting transition coordinates and regimes vary.